Evaluation of the Influenza Sentinel Provider Network Surveillance System in Utah, 2006-07 Influenza Season

Lisa Wyman, MPH[1]; Lisa Gren, MSPH[2]; Melissa Dimond, MPH[1]; Catherine Staes, BSN, MPH, PhD[3]

[1]Bureau of Epidemiology, Utah Department of Health; [2]Public Health Program and [3]Department of Biomedical Informatics, University of Utah; Salt Lake City, Utah

Background

The average direct cost of influenza in the United States is estimated between $1 and $5 billion annually.

The average annual mortality due to influenza is estimated at 36,000 deaths per year.

The Sentinel Provider Influenza Surveillance System has approximately 700 clinical sites in the United States that submit data each week on the percentage of patients who present with influenza-like symptoms.

Objectives

We evaluated the Sentinel Provider System in Utah to:

- describe the current processes and flow of information for ILI surveillance.
- understand system attributes that may contribute to under- or over-reporting.

Methods

We used evaluation guidelines published by CDC (MMWR, 2001) to assess selected surveillance system attributes (e.g., sensitivity, simplicity, etc).

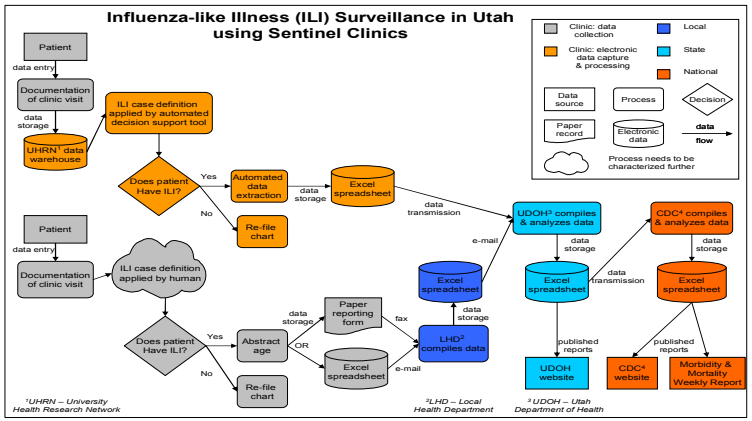
We interviewed staff responsible for ILI reporting at three sentinel sites, including two sites that use a manual chart abstraction method and are suspected of under-reporting (clinic A) or over-reporting (clinic B), and one site that uses an automated method to extract information from an electronic health record (clinic C).

We assessed implementation of the CDC case definition for influenza-like illness (ILI): **fever of 100F or higher, and (cough or sore throat), in the absence of a known cause other than influenza.**

We compared the pattern of reported ILI with reports of hospitalized influenza cases reported in Utah during the same period.

Results

Fig 1. Processes and flow of information for ILI reporting in Utah, 2006-07



Representativeness: Nine (75%) of the 12 clinics included in the national system are located in counties along the Wasatch Front where 76% of Utahns reside.

Simplicity:

- After orientation with health department staff, each sentinel clinic could determine their own process for applying the case definition in their setting.
- Clinics that manually identify cases require a staff member to tabulate and report the findings.
- Clinics in one healthcare network use an automated method to identify cases by routinely applying an algorithm to data stored in an enterprise data warehouse. Clinical staff from the sentinel site are not involved in case detection and reporting.

Timeliness: Summary information about Utah ILI activity is available on the Utah Dept of Health website two days before it is available on the CDC website.

Sensitivity and Data Quality:
No algorithm exists in the automated method for formally assessing the "absence of a known cause other than influenza" part of the case definition.

There were differences in how the CDC case definition was implemented at different sites (**Table 1).** All of the concepts included in the case definition were not always used.

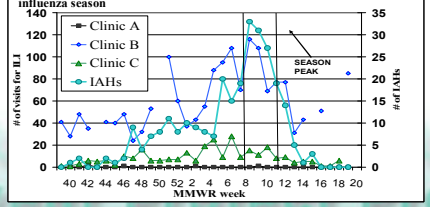
Figure 2 shows:

- Two of the three clinics showed increased ILI activity during the same weeks that influenza-associated hospitalizations increased, regardless of whether data collection was manual or automated.
- One clinic did not show increased activity during this time period, which most likely reflected a difference in how the case definition was implemented.
- ILI increases were detected that did not correspond with increased influenza-associated hospitalizations.

Table 1. Concepts used for case finding in three sentinel clinics participating in ILI surveillance in Utah, 2006-2007 influenza season.

	Fever	Cough or sore throat	Absence of a known cause other than influenza
Clinic A (manual)	INCONSISTENTLY APPLIED	INCONSISTENTLY APPLIED	NO
Clinic B (manual)	YES	YES	NO
Clinic C (electronic)	YES	YES	NO

Figure 2. Number of visits for ILI reported by sentinel clinics and lab-confirmed, influenza-associated hospitalizations (IAHs)—Utah, 2006-07 influenza season



Conclusions

The CDC case definition for ILI is not consistently applied. Specifically, the "absence of a known cause other than influenza" concept is not captured in either the manual or automated logic.

ILI activity tracks influenza activity, but specificity is lacking as other respiratory viral activity is captured.

While ILI surveillance may seem simple, it is not. Many entities and data transfers are involved in the system.

Electronic reporting of ILI data has simplified a surveillance system that can be a significant burden for data providers.

The distribution of sentinel clinics in Utah mirrors the state's population distribution.

Recommendations

Evaluate other clinics in Utah's Sentinel Provider Influenza Surveillance System and at the national level. Consistency of case definition application needs to be determined.

As electronic medical record systems become more prevalent, implement automated case detection and reporting systems.

Develop infrastructure at the local, state, and national level to receive electronic ILI reporting.

Develop standardized logic to ensure consistent ILI case detection among sentinel sites.

Acknowledgements

Andrea Price and Ilene Risk, Salt Lake Valley Health Department
Ken Gondor, University of Utah Health Network
Melissa Jensen and Noreen Johnson, participating clinics
Rachelle Boulton and Juliana Grant, Utah Department of Health
Chris Olola, University of Utah

of Health